IN THE UNITED STATES INTERNATIONAL

PRELIMINARY EXAMINING AUTHORITY (IPEA/US)

International Appln. No.:	PCT/US02/41546
International Filing Date:	27/12/2002
Priority Date Claimed:	27/12/2002
Title:	SYSTEM AND METHOD FOR RESOURCE USAGE PREDICTION IN THE DEPLOYMENT OF SOFTWARE APPLICATIONS
Applicant's Reference:	PCT 10/100,000 (Dkt.604-L)
Applicant:	UNISYS CORPORATION Blue Bell, Pennsylvania, USA
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RESPONSE TO WRITTEN OPINION

November 9, 2004

International Preliminary Examining Authority
Mail Stop PCT, ATTN: IPEA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Written Opinion mailed 16 September 2004, regarding the above-captioned International application, it is requested that the Examiner review and consider the following responses presented herein.

A copy of the original set of claims with amendments is enclosed, which claims will be later discussed and evaluated to indicate that the established original claims do actually present a novel and inventive set of claim definitions.

IN THE CLAIMS:

Please find an attachment of Replacement pages 19, 20, and 21 to replace the originally printed PCT Application claims.

These will show amendments to claims 9, 18, 19, and 22, which merely involve minor phrasing clarifications.

REMARKS

In response to the PCT Written Opinion dated 16 September, 2004, Applicants are herein presenting their considerations and arguments in regard to the Examiner's evaluation of the originally provided claims.

The Examiner has entered that claims 1-5, 7-14, 21 and 22, have been anticipated by U.S. Patent 6,421,778 to Wood, et al.

> The Examiner has cited certain factors of the Wood reference, such as the Abstract and Figs. 2, 3 and 5, and stated that Wood calculates modular application-independent programs for a scaleable program with parameter values and Wood sets default values, as stated in column 6, lines 50-60, and does re-calculations at column 6 lines 60-70.

In regard to these factors, Applicants would traverse Examiner's consideration as to the factor of anticipation, as will be subsequently illustrated.

Also, in regard to Applicant's claim 22, Examiner "contends" that Fig. 3 of the Wood reference would store historic values in a Table Data store, plus Optimal Settings in a data store, as well as a temporary data store while

referring to Wood, Figs. 6a, 6b, 6c, 6d, 6e and 7b. It should be noted that Wood's Table Data Store 220 merely holds features and not historic data.

In this aspect, Applicants would again traverse Examiner's consideration that this "Table Data Store" aspect of Wood correlates to any feature of Applicant's invention, as will be discussed hereinafter.

Applicants, at this juncture, would reiterate that they consider that Applicants' independent claims are certainly novel and inventive over the teachings of the Wood reference. Further, Applicants' invention will be seen to have quite a distinctively different purpose from that of the Wood reference.

APPLICANTS' CLAIMED INVENTION:

Applicants' invention in the present PCT application is directed to a method and system for estimating resource usage. The term "resource" here encompasses almost any computing-related parameter, (including that of "time") in the deployment of a software application on any particular type of computing system.

In its broadest claimed aspect, Applicants' invention is directed to calculating the resources required to deploy a software application. Applicants' methodology broadly includes the steps of:

(a) Providing historical data with regard to the resource utilization during deployment of the software application;

(b) Providing a value for a parameter relevant to the subject of resource utilization;

(c) Providing a value for a parameter relevant to the software application involved; and

(d) Using the data and values obtained in steps (a)-(c) to predict a quantity (quantifiable amount) of resources required for the deployment of the particular software application.

An embodiment of this methodology is shown in Applicants' Fig 3 which very clearly outlines the method steps involved.

NOVELTY ASPECTS:

The Examiner seems to reason that claims 1-5, 7, 10-14, 21 and 22, are not novel in view of the Wood reference, U.S. Patent 6,421,778. But note that the Wood reference describes a method for optimizing a software program, by taking advantage of the full feature set of the hardware. This is achieved by analyzing the hardware and subsequently changing the software settings in order to make best use of the hardware. While superficially there are some similarities between the Wood method and Applicants' method claimed in claim 1, but it should be noted there are still exceptionally substantive differences involved between the two separate methodologies.

First, it should be noted that each claimed invention (as between Wood and Applicants) has a very different purpose. The Wood methodology

attempts to modify a software application in order to make best use of the available hardware resources. That is to say, Wood describes a methodology for optimizing a software application in view of the limitations of the hardware.

> Applicants' claimed invention, in great contrast, is directed to predicting the time taken (or the resources required) to deploy a software application. Thus, the Wood reference is directed to a very different problem and discloses a very different subject matter. It is quite difficult to see how the Wood reference can be considered analogous art when compared to Applicants' claimed invention.

Secondly, there is no disclosure in the Wood reference of providing "historical data" with regard to previous software deployments. This feature is missing in Wood, because the Wood invention does not require historical data with regard to the development of the software application involved, as Wood is not concerned with the resources required to deploy a software application.

> As noted in the Wood reference at column 7, lines 26-48 regarding the Table Data Store (line 41) --- System 205 inserts the feature, setting, tag, cost and benefit into Data Store 220 ----.

The Data Store 220 is not historical data, but only a table of features.

Thirdly, Wood does not attempt to calculate the resources required to deploy a software application. As previously stated, Wood is concerned with optimizing a software application in view of the hardware of a computing system, such that software application may then take full advantage of the hardware. Thus, in Wood, there is no need to calculate the amount of resources required for deployment of a software application, as Wood is not concerned with the deployment of software.

It is conceivably arguable that the Wood reference does describe a process which involves the collection of data in a manner analogous to the steps (b) and (c) above. However, the Wood reference is concerned with --- optimizing a software application in view of the available hardware.

Applicants' claimed invention, in great contrast, makes no attempt whatsoever to modify a software application. Applicants' invention is concerned with predicting the amount of resources to be utilized in deploying a software application, given certain parameters regarding the software application and the hardware involved.

It is most difficult to see how the Examiner can read the Wood disclosure into Applicants' independent claims

1 and 10. Furthermore, as a curious note, it appears the Examiner believes that claim 1 is not novel or inventive, but when the claim 1 methodology is embodied in a computer program, it somehow becomes rendered novel and inventive --- for example, the Examiner rejects claim 1, but allows claim 19, which recites a computer program which actually carries out the method of claim 1.

Applicants would herein assert that claims 1 and 10 are clearly novel over the Wood reference citation, and additionally, the other claims, by virtue of their dependency on these claims, are also novel.

REGARDING APPLICANTS' CLAIMS 21 AND 22:

Regarding Applicants' claims 21 and 22, Applicants would wish to indicate that while the Wood reference discloses a database which stores optimization data, it should be indicated that this is not equivalent to the special feature recited in claim 21 which refers to:

> "Collecting historical resource utilization data for deployment of software applications".

The database utilized in the Wood reference is utilized to collect data regarding the optimal settings for a particular item of software in view of the hardware available of a particular machine. Therefore, it is contended that the Wood reference does not read onto claims 21 and 22. So, in this regard, the Examiner's novelty objection could not be deemed sustainable.

OBVIOUSNESS (INVENTIVE STEP):

It would appear the Examiner has raised an inventive step objection to claims 1-5, 7, 10-14, 21 and 22, on the basis that these are not novel and therefore, not inventive. Now, since the Examiner has provided no substantive comment on the inventiveness of any of the claims, nor has Examiner explicitly cited any art other than the Wood reference, Applicants do therefore contend that these claims are certainly worthy of being considered as an inventive step.

INDUSTRIAL APPLICABILITY:

Another factor involved here, is that the Examiner has rejected all the claims on the basis that they are not "industrially applicable" for:

> "Failing to be recorded on a computer-readable medium and execute on a computer".

It would appear that the Examiner is rejecting the claims on the basis that some of the claims do not positively recite a "technical feature". This is considered to be a strange objection, as there is no requirement, on a reading of Article 33(4) that a claimed invention must include the explicit recitation of a technical feature.

> Rather, on the other hand, it would seem that industrial applicability is concerned with whether the claimed invention has a technical "character", that is to say, a claimed invention is industrially applicable if it involves a physical activity which belongs to the useful arts, as opposed to the aesthetic arts.

Applicants' claimed invention clearly falls within the category of a useful art, as it is a technique utilized to determine the time and/or the resources required to deploy a software application to a plurality of computing systems, thereby allowing a deployer to plan and organize the deployment of software in a logical and efficient manner.

> Applicants' method finds utility in organizations where a system administrator is required to provide a new application to a multitude of users in an efficient manner, whilst balancing the need to minimize any interruption to the productivity of the various users.

Additionally, the Examiner appears to object to claims 10-18, even though these claims positively recite the supposedly missing technical feature of "executing on a computer". Note, that similarly, claim 19 explicitly describes a computer-readable medium, yet, the Examiner apparently also cites this claim for lack of industrial applicability.

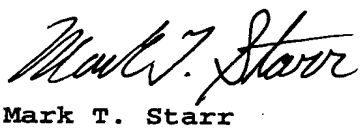
So, in this regard, it is believed that the Examiner should reconsider these claims in a more expansive fashion and then understand that the industrial applicability objection cannot reasonably be sustained.

CONCLUSION:

In view of the preceding discussion and arguments, it should be indicated that there is a substantial difference in purposes involved and other technical differentiation

between the cited reference to Wood, and the system and methodology of Applicants. These involve certain new, inventive, and differentiative factors, which, it is respectfully requested that Examiner should review and appreciate the useful and novel features thereof and subsequently provide a timely Notice of Allowance therefor.

Respectfully submitted,



November 9, 2004

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CLAIMS:

1. A method of predicting a quantity of a resource required for the deployment of a software application on a computing system, comprising the steps of providing historical resource utilisation data for deployment of software applications on computing systems, providing a value for a parameter of the computing system relevant to resource utilisation, providing a value for a parameter of the software application relevant to resource utilisation, and utilising the historical resource utilisation data and parameter values to predict the quantity of the resource required for deployment of the software application.

2. A method in accordance with claim 1, wherein the historical resource utilisation data includes parameter values of the computing systems and parameter values of the software applications historically deployed.

3. A method in accordance with claim 2, wherein the historical resource utilisation data includes statistics, the statistics being values of the quantities of resources used in the historical deployment.

4. A method in accordance with claim 3, wherein the historical resource utilisation data includes at least two parameter/statistic pairs for historical deployments.

5. A method in accordance with claim 3, wherein the relationship between the parameter and statistic pairs is derived by applying a statistical model to the parameter/statistic pairs.

6. A method in accordance with claim 4, wherein a relationship is predicted between a statistic and n distinct parameters, where n is any integer greater than or equal to two, comprising the further step of obtaining m_n different values for each parameter P_n, and further obtaining at least $m_1m_2...m_n$ values of a statistic for each distinct combination of parameter values, where $m_1m_2...m_n$ represents the product of values m_1, m_2, ... m_n.

7. A method in accordance with claim 5, wherein the relationship between the statistic and the parameter or n

parameters is determined by assuming that the relationship between the parameter/statistic pairs takes the form of a straight line.

8. A method in accordance with claim 6, wherein the equation of the straight line is calculated using co-ordinate geometry.

9. A method in accordance with claim 7, wherein said statistical model mathematically takes the form:

$$S = S_a + \frac{(S_c - S_a)}{(c - a)}(P_k - a)$$

10. A computing system arranged to facilitate the prediction of a statistic for use in the prediction of resources required for the deployment of a software application, comprising, a database arranged to provide historical resource utilisation data for deployment of software applications on computing systems, means for providing a value for a parameter of the computing system relevant to resource utilisation, and a value for a parameter of the software application relevant to resource utilisation, and computation means arranged to utilise the historical resource utilisation data and parameter values to predict the quantity of the resource required for deployment of the software application.

11. A system in accordance with claim 10, wherein the historical resource utilisation data includes parameter values of the computing systems and parameter values of the software applications historically deployed.

12. A system in accordance with claim 11, wherein the historical resource utilisation data includes statistics, the statistics being values of the quantities of resources used in the historical deployment.

13. A system in accordance with claim 12, wherein the historical resource utilisation data includes at least two parameter/statistic pairs for historical deployments.

14. A system in accordance with claim 13, wherein the

relationship between the parameter and statistic pairs is derived by applying a statistical model to the parameter/statistic pairs.

15. A system in accordance with claim 14, wherein a relationship is predicted between a statistic and n distinct parameters, where n is any integer greater than or equal to two, comprising the further step of obtaining m_n different values for each parameter P_n, and further obtaining at least $m_1m_2..m_n$ values of a statistic for each distinct combination of parameter values, where $m_1m_2..m_n$ represents the product of values m_1, m_2, ... m_n.

16. A system in accordance with claim 15, wherein the relationship between the statistic and the parameter or n parameters is determined by assuming that the relationship between the parameter/statistic pairs takes the form of a straight line.

17. A system in accordance with claim 16, wherein the equation of the straight line is calculated using co-ordinate geometry.

18. A system in accordance with claim 17, wherein said equation involves a statistical model which mathematically takes takes the form:

$$S = S_a + \frac{(S_c - S_a)}{(c-a)}(P_k - a)$$

19. A computer program arranged, when loaded on a computing system, to implement the method of claim 1.

20. A computer readable medium providing a computer program in accordance with claim 19.

21. A method for building a model for use in the prediction of resources required for the deployment of a software application, the method comprising the steps of collecting historical resource utilisation data for deployment of software applications on computing systems, and storing the historical resource usage data.

22. A statistical model comprising historical resource utilisation data for deployment of software applications on computing systems, said data being stored in a database.